Claims

1. A method of identifying chemical substances which have potential pharmacological activity using nematode worms, which method comprises the steps of:

(a) dispensing substantially equal numbers of nematode worms into each of the wells of a multi-well assay plate;

(b) contacting the nematode worms with a chemical substance;

(c) detecting a signal indicating phenotypic, physiological, behavioral, or biochemical changes in the nematode worms using non-visual detection means;

wherein step (a) is performed in a multi-well plate with liquid medium containing a water soluble polymer at a concentration sufficient to increase the viscosity of the medium;

wherein the water soluble polymer is medium viscosity carboxymethyl cellulose and the concentration of water soluble polymer in the liquid is 0.3% weight per volume (w/v).

2. A method of identifying chemical substances which have potential pharmacological activity using nematode worms, which method comprises the steps of:

(a) dispensing substantially equal numbers of nematode worms into each of the wells of a multi-well assay plate;

(b) contacting the nematode worms with a chemical substance;

(c) detecting a signal indicating phenotypic, physiological, behavioral, or biochemical changes in the nematode worms using non-visual detection means;

wherein step (a) is performed in a multi-well plate with liquid medium containing a water soluble polymer at a concentration of from 0.01% to 10% weight per volume (w/v) in the liquid medium.

3. The method as claimed in claim 2 wherein the water soluble polymer is polyethylene glycol, polyvinyl alcohol, or polyvinylpyrrolidone.

4. A method as claimed in claim 2 wherein the concentration of water soluble polymer in the liquid medium is 0.1% weight per volume (w/v).

5. A method of identifying chemical substances which have potential pharmacological activity using nematode worms, which method comprises the steps of:

(a) dispensing substantially equal numbers of nematode worms into each of the wells of a multi-well assay plate,

(b) contacting the nematode worms with a chemical substance;

(c) detecting a signal indicating phenotypic, physiological, behavioral, or biochemical changes in the nematode worms using non-visual detection means,

wherein the assay is carried out in a liquid medium having a viscosity greater than M9 medium, and wherein the liquid medium contains a water soluble polymer at a concentration of from 0.01% to 10% weight per volume (w/v) in the liquid medium.

6. The method as claimed in claim 5 wherein the nematode worms are microscopic nematodes.

7. The method as claimed in claim 6 wherein the nematode worms are *C. elegans* or *C. briggsae.*

8. The method as claimed in claim 5 wherein the step of detecting a signal comprises detecting a change in a measurable property of a marker molecule, whereby a change in the property of the marker molecule indicates a phenotypic, physiological, behavioral, or biochemical change in the nematode worms.

9. The method as claimed in claim 8 wherein the marker molecule is a fluorescent molecule, a luminescent molecule, or a coloured molecule.

10. The method as claimed in claim 8 wherein the marker molecule is a precursor of a fluorescent molecule, a precursor of a luminescent molecule, or a precursor of a coloured molecule.

11. The method as claimed in claim 10 wherein said marker molecule is capable of being cleaved by the action of an enzyme present in the gut of *C. elegans* to generate a fluorescent molecule, a luminescent molecule, or a coloured molecule.

12. The method as claimed in claim 5 wherein the non-visual detection means is a multi-

well plate reader.

13. The method as claimed in claim 12 wherein the multi-well plate reader performs luminescence, fluorescence, or spectrophotometric detection.

14. The method as claimed in claim 5 wherein the non-visual detection means is a fluorescence activated nematode screening and sorting (FANS) device.

15. The method as claimed in claim 14 wherein the FANS device performs luminescence, fluorescence, or spectrophotometric detection.

16. The method as claimed in claim 5 wherein step (a) comprises dispensing substantially equal volumes of a homogeneous suspension of nematode worms into each of the wells of the multi-well assay plate.

17. The method as claimed in claim 16 wherein the homogeneous suspension comprises a suspension of *C. elegans* in a viscous solution.

18. The method as claimed in claim 17 wherein the viscous solution comprises a solution of a polymer material.

19. The method as claimed in claim 18 wherein the polymer material is low melting point agarose.

20. The method as claimed in claim 5 wherein the nematode worms are synchronized in the same growth stage.

21. The method as claimed in claim 20 wherein the nematode worms are eggs, L1 stage, L2 stage, L3 stage, L4 stage, adult worms, or dauer worms.

22. The method as claimed in claim 20 wherein the worms are hermaphrodites or males.

23. The method as claimed in claim 5 wherein the nematode worms are a wild type strain, a mutant strain, a transgenic strain, or a humanized strain.

24. The method as claimed in claim 5, wherein step (a) is performed in a multi-well plate with liquid medium containing a water soluble polymer at a concentration sufficient to increase the viscosity of the medium.

25. The method as claimed in claim 24 wherein the water soluble polymer is carboxymethyl cellulose, low melting point agarose, or polyethylene glycol.

26. The method as claimed in claim 25 wherein the water soluble polymer is medium viscosity carboxymethyl cellulose.

27. The method as claimed in claim 24 wherein the concentration of water soluble polymer in the liquid medium is 0.3% weight per volume (w/v).

28. The method as claimed in claim 5 wherein step (a) is performed in a multi-well plate with liquid medium containing a water soluble polymer at a concentration sufficient to prevent the nematode worms from sticking to the wells of the multi-well plate.

29. The method as claimed in claim 28 wherein the water soluble polymer is polyethylene glycol, polyvinyl alcohol, or polyvinylpyrrolidone.

30. The method as claimed in claim 28, wherein the concentration of water soluble polymer in the liquid medium is 0.1% weight per volume (w/v).